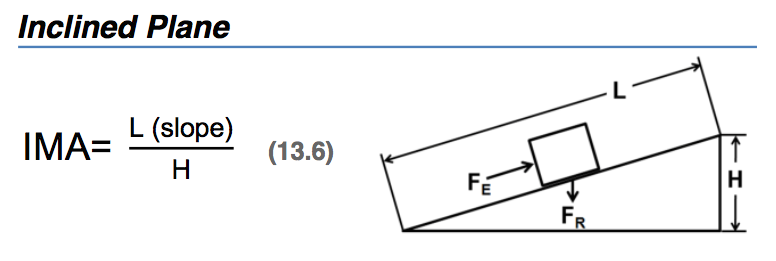
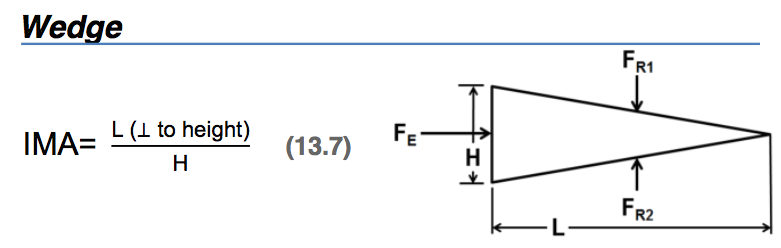
**FOUNDATIONS/PRINCIPLES OF ENGINEERING**

**REFERENCE TABLES**

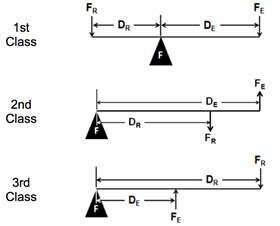


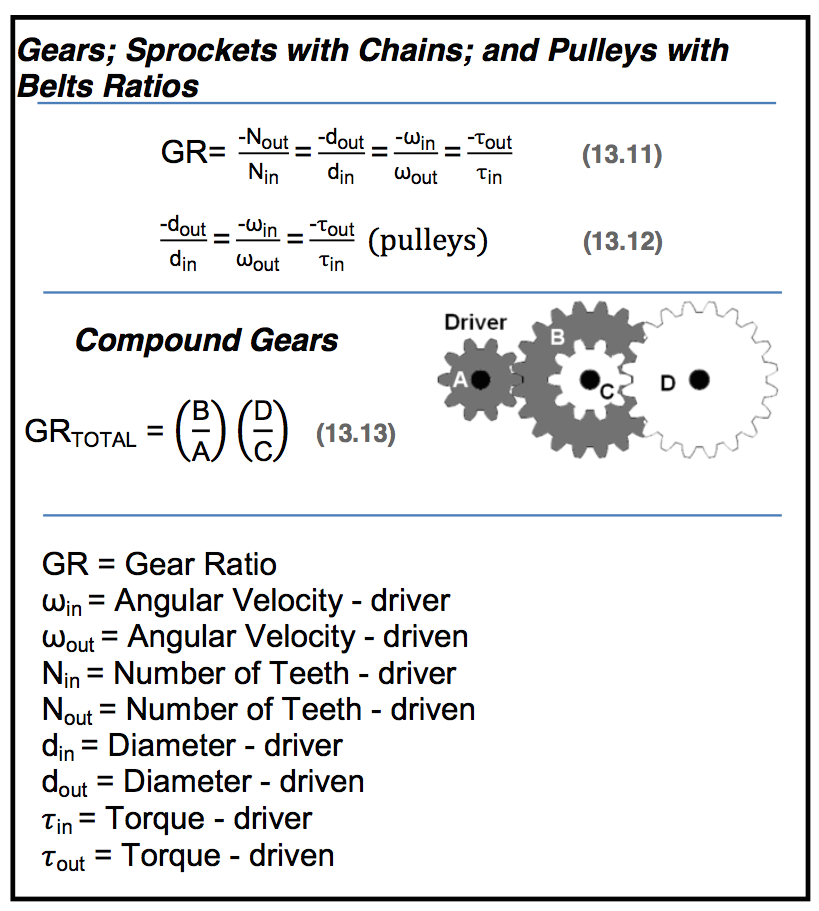
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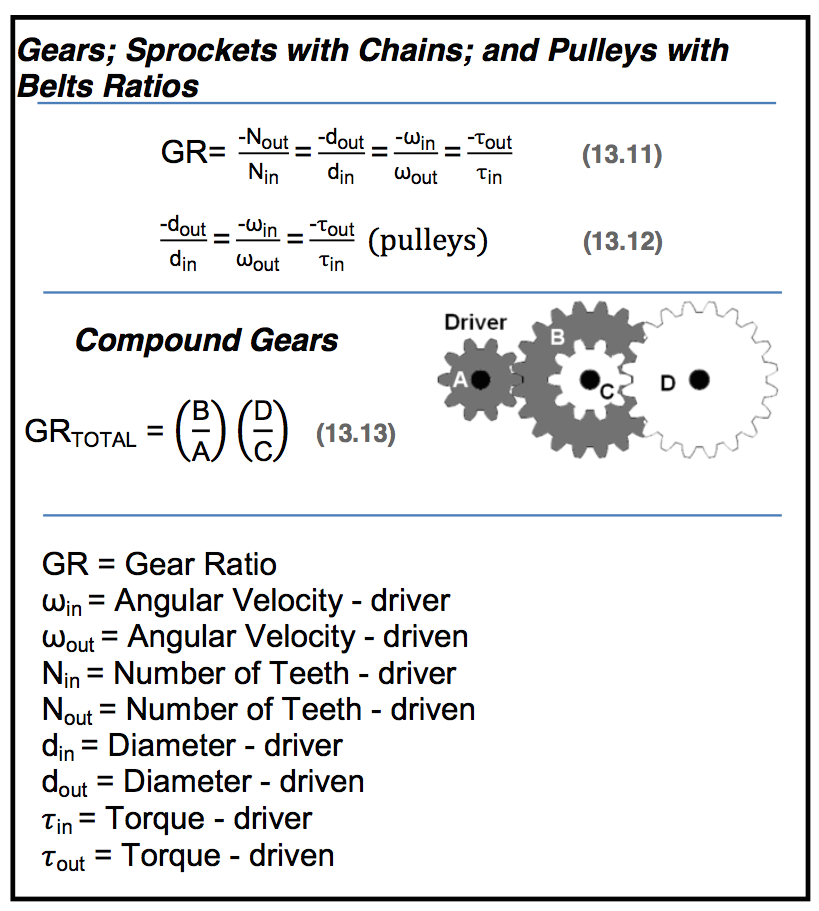
***Gears, Sprockets with Chains and Pulleys with Belts Ratios***

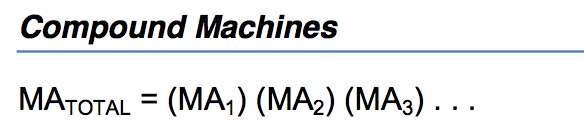


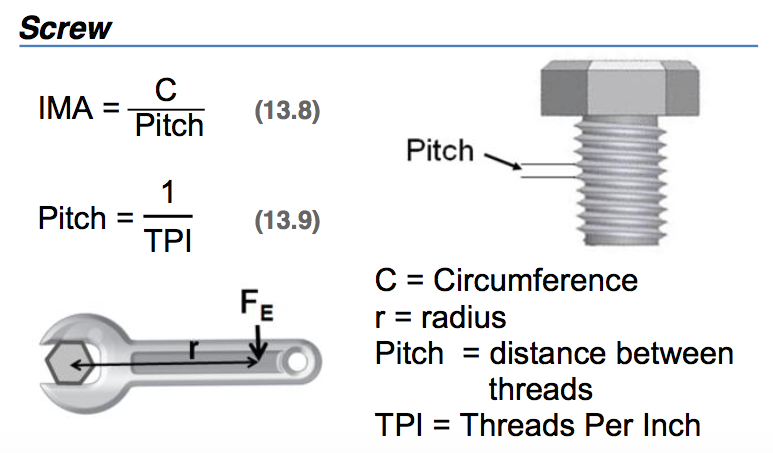
***Lever***









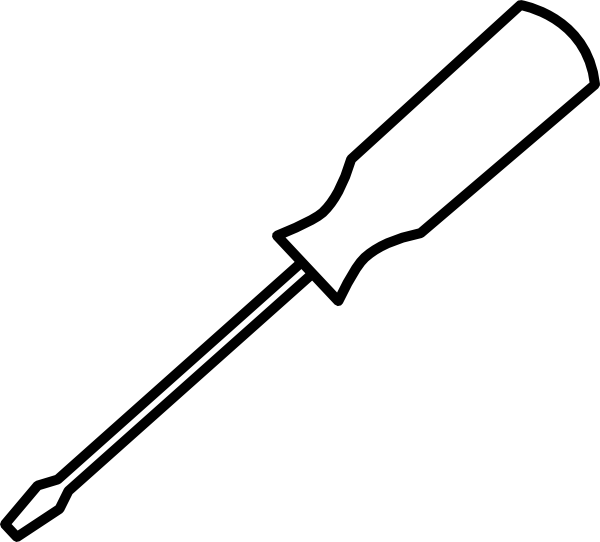


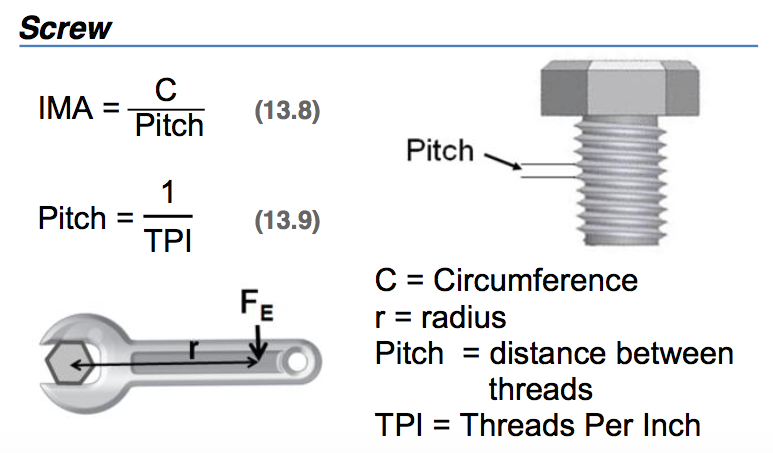
**When installing with a**

**wrench**

**When installing with a**

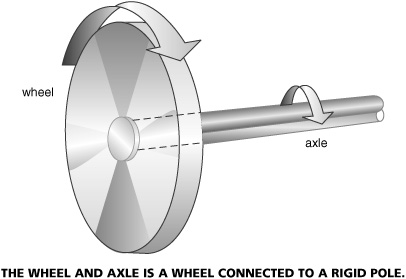
**screwdriver**

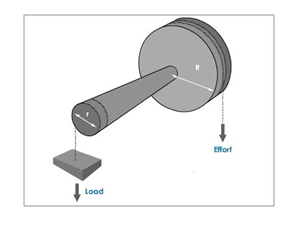
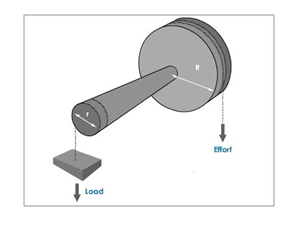




d



***Wheel and Axle***

****

Resistance

Effort

Effort

Resistance

**For Effort on the Axle**

**For Effort on the Wheel**

= average speed/average velocity

vf = final velocity

vi = initial velocity

a = acceleration

t = time

d = distance/displacement

x = range (for projectiles only)

= theta, angle measured to the horizon

g = acceleration due to gravity



V=Voltage

I = Current

R= Resistance

W = work

P = Power

C = Capacitance

**Series total Resistance**

**Parallel total Resistance**

**Kirchoff’s Current Law**

**Statics and Newton’s Second Law:**

**In Static Equilibrium**

Fnet = net Force

m = mass

a = acceleration

M = moment

F = force

= perpendicular distance

J= Joints

M = members

R = Reaction Forces

Fx = forces in the “x”

Fy = forces in the “y”

Mpoint = moments about a point

= sum

**Kirchoff’s Voltage Law**

**Parallel total Capacitance**

**Series total Capacitance**

**Mechanical Energy:**

KE = Kinetic Energy

m = mass

v = velocity

PE = Potential Energy

g = acceleration due to gravity

h = height

W = work

F = force

d = distance

t = time

P = Power

Pout = output power

Pin = input power

Q = Energy transfer

m = mass

c = specific heat capacity

t = time

T = Temperature

P = Rate of Energy transfer

A = area

k = Thermal Conductivity

L = Thickness

U = Thermal Conductance

R = Thermal Resistance

е = emissivity constant of the material

σ = Stefan’s Constant

**Efficiency:**

**Thermodynamics:**

**Temperature Conversions:**

TR = Temperature in Rankine

TF = Temperature in Farenheit

TC = Temperature in Celsius

TK = Temperature in Kelvin

**Fluid Power**

Q = Flow Rate

V = Volume

v = velocity

t = time

d = distance

A = area

P = Pressure

Fout = output force

Fin = input force

P = Pressure

V = Volume

T = Temperature

Ixx = Moment of Inertia

b = base

h = height

Max = Deflection

F = Force

L = Length

E = Modulus of Elasticity

= stress

A = Area

ε = strain

δ = deformation

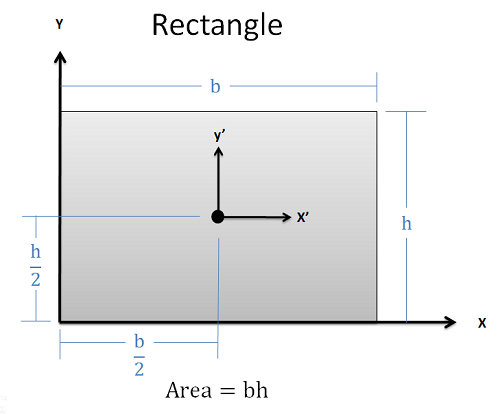
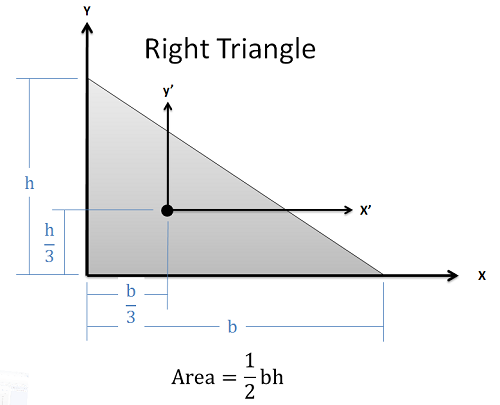
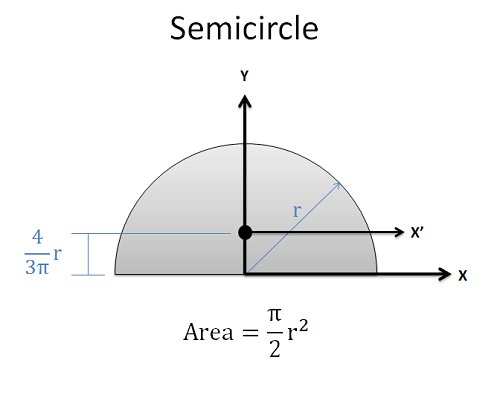
**Boyle’s Law:** (Note: Pressure must be absolute)

**Charles’ Law:** (Note: Temperature must be absolute)

**Gay Lussac’s Law:** (Note: Pressure and Temperature must be absolute)

**Stress, Strain, Deformation**

**Centroids:**



**Centroids of Complex Shapes:**

C = circumference

r = radius

d = diameter

b = base

h = height

A = area

